

Does Hazard-Based Communication Work?

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Introduction

The view that risks and hazards are distinct concepts is commonly held in the scholarly literature on risk especially in the English-speaking community¹. The dichotomy is also enshrined in key documents commissioned or developed by Governments to help regulators conceptualise, regulate and communicate harmful events². Yet, the implications of risk-based versus hazard-based regulations have often been overlooked. Scholars have only conducted limited discussions, in contrast to the extensive debates about the respective merits of evidence-based and precautionary-based regulation³. Lofstedt's article "Risk versus Hazard – How to Regulate in the 21st Century" offers a new and important perspective on the relationship between science and regulatory decisions. Lofstedt essentially argues that the conceptual distinction between hazards (the potential for a substance, activity or process to cause harm or adverse effect) and risks (a combination of likelihood and the severity of a substance, activity or process to cause harm)⁴ presents a meaningful classification to analyse regulations. The article also implies that the risk versus hazard dichotomy has important impli-

cations for the critical choices that regulators make when they struggle with the regulation of potentially harmful events. Lofstedt's point is underpinned by a detailed analysis of how European regulators are currently tackling two chemical compounds, namely a human-made chemical used in the manufacture of plastics (Bisphenol A) and a brominated flame retardant (Deca BDE). The arguments come across as particularly convincing, with strong empirical evidence.

Lofstedt's article triggers fundamental questions. In a post-trust environment characterised by "multiple actors at different member state and European levels pushing their own views and opinions on how regulation should be formed", do hazard-based strategies work? Do they require similar or different approaches to the communication of scientific evidence/uncertainty? Is there such thing as a "hazard-based communication"? This short contribution does not pretend to answer these questions at once. However, based on recent examples from the Health and Safety sector one foresees the multiplicity of challenges that regulators may face when they decide to follow hazard-based strategies.

Hazard-based regulation practices

Lofstedt emphasises the fact that, currently, there is no such thing as European-wide science based risk regulation. The author highlights the potential of a system based on more science and evidence. Key suggestions include the creation of a scientific advisory board for the European Parliament, or establishing a chapter of the Society for Risk Analysis in Scandinavia. It is also clear that in the author's view, these measures will go hand in hand with greater risk-based regulatory thinking. At the same time, structural factors may limit the potential for risk-based approaches, for example the distrust of environmental regulators for risk assessment, as well as the high cost of the assessments – which may become a deterrent in the context of scarce public funding. Our view is that, in the foreseeable future, solutions that focus on the intrinsic property of a substance to cause harm rather than the likelihood and severity of the dam-

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1 National Research Council (NRC) *Risk Assessment in the Federal Government: Managing the Process* (Washington DC: National Academy Press 1983); UK Royal Society, *Risk: Analysis, Perception, Management* (London: Royal Society 1992); Baruch Fischhoff, Stephen R. Watson, and Chris Hope, "Defining Risk", 17 *Policy Sciences* (1984), pp. 123 et seq., at p. 139; Carlo C. Jaeger, Ortwin Renn, Eugene A. Rosa and Thomas Weibler, *Risk, Uncertainty, and Rational Action* (London and Sterling, VA: Earthscan 2001).

2 HSE, *The Tolerability of risks from nuclear power stations* (Sudbury: HSE Books, 1988); Health Council of the Netherlands, *Not All Risks are Equal*, Publication No. 1995 06E, Committee on Risk Measures and Risk Assessment (The Hague: Health Council of the Netherlands 1995); Better Regulation Commission (BRC), *Risk, Responsibility and Regulation. Whose risk is it anyway?* (London: Better Regulation Commission 2006).

3 For a recent account of these debates see the edited volume by Jonathan B. Wiener, Michael D. Rogers, James K. Hammitt, and Peter H. Sand, *The Reality of Precaution. Comparing Risk Regulation in the United States and Europe* (Washington DC and London: Resources For the Future 2011).

4 UK Royal Society, *Risk: Analysis, Perception, Management* (London: Royal Society 1992).

age are likely to remain a significant aspect of the European regulatory practice. Nevertheless, hazard-based approaches may create specific communication constraints and challenges that should not be overlooked. In this respect, UK Health and Safety regulation offers an interesting example. In Britain, non-nuclear hazards involving dangerous substances are regulated through the Control of Major Accident Hazards (COMAH) 1999. Most of the risks that fall into this category are subject to a probabilistic risk-based management. Flammables (including critical installations such as gas and petroleum storage facilities), however, have been dealt with on the basis of protection against the hazard itself⁵ without any Quantitative Risk Assessment (QRA). Experts of the Health and Safety Executive (HSE) explain this approach by the lack of reliability of the probabilistic assessment of flammables⁶. The consequence is that HSE has developed a management model that concentrates on protection against the hazard itself. Considerations such as risk/benefits tradeoffs and levels of risk acceptability have been minimal. Because of its political nature and economic relevance the process followed for the siting of new facilities is of particular interest:

“Under the current system, once hazardous substances consent has been granted, the HAS passes the papers to HSE who defines on a map the area within which planning authorities have to consult HSE for other planning applications. This is called the ‘consultation distance’. HSE also sets three zones within the consultation distance which are the basis for HSE’s advice.”⁷

Protection against the hazard is therefore implemented on the basis of maps that allocate specific developments to specific distances. For example HSE expert models suggest that a shop may be built at a much shorter distance of the hazardous site than a school or a hospital. The decision rests with the Local Planning Authorities (LPAs), while HSE remains the “watchdog” of the planning process: it may “advise against” a development and may invite the Secretary of State for Communities and Local Government (and the relevant minister in Wales) to “call in” the decision for review.

In the early hours of Sunday 11th December 2005, a number of explosions occurred at the fifth largest oil-products storage depot in the United Kingdom, the so-called Buncefield Oil Storage depot. This was an installation of critical importance based in Hemel Hempstead, 23 miles North West of London. The ex-

plosion was a major blast, which did not take any lives but caused considerable damage. As a proactive response to this major event, HSE used its legal powers to launch an independent investigation about the circumstances of the incident. The Buncefield investigation board (MIIB) was established and chaired by Lord Newton of Braintree, a well-respected and consensual Westminster figure. The style of the Board’s investigation was mostly consistent with the state of the art of risk-based communication, involving clear messages and regular updates, frequent dialogues with critical stakeholders, a pacified debate concentrating on the root causes of the incident, the maintenance of a strong scientific dimension throughout the investigation process, partnerships with independent members of the public trusted in their community⁸. Interestingly, MIIB felt the constraint of the hazard-based model used for flammables, which it criticised for not being scientifically robust:

“We explain that the simplified, generic approach to risk assessment currently used around flammable storage sites needs to be replaced by a site-specific assessment of risks, using QRA methods, leading to a planning system that is more responsive to the levels of risk posed by each particular site.”⁹

The investigation board offered a number of policy recommendations, which may prompt a rethink of the local planning approach from a hazard-based model towards a risk-based model. The 8th report of the Board of July 2008 combined an analysis of evidence from the Buncefield investigation and the results of research into risk-based planning. It formulated 18 recommendations for “improvements in the UK planning system, including a fundamental review of the entire system, a consistent and fully

5 See, for example, Dangerous Substances and Explosive Atmospheres Regulations 2002 SI 2002/2776; BS EN 1127-1 2007 Explosive atmospheres, explosion prevention and protection, basic concepts and methodology.

6 Health and Safety Executive (HSE), *Improving health and safety. An analysis of HSE’s risk communication in the 21st century*, Research report RR785 (Norwich: Her Majesty’s Stationary Office 2010).

7 Major Incident Investigation Board (MIIB), “The Buncefield Incident 11 December 2005. The final report of the Major Incident Investigation Board”, available on the Internet at <<http://www.buncefieldinvestigation.gov.uk/reports/index.htm#final>> (last accessed on 30 March 2011), at p. 11.

8 HSE, *Improving health and safety*, *supra* note 6.

9 MIIB, “Recommendations on land use planning and the control of societal risk around major hazard sites”, 2008, available on the Internet at <<http://www.buncefieldinvestigation.gov.uk/reports/comahreport3.pdf>> (last accessed on 30 March 2011), at p. vii.

risk-based system for planning controls at all major hazard sites, the incorporation of societal risk into assessments of planning applications, and for better alignment with the COMAH regime".¹⁰

A second case, also involving flammables, further demonstrates the challenges posed by hazard-based communication. The case started in January 2007 when the Surrey County Cricket Club announced its project to build a new stand and hotel at the Oval cricket ground next to gasholders. Of course gasholders present a risk of ignition, which in this case could easily lead to a major disaster. The new development prompted concerns among HSE experts. Yet, the discussions between the local authority and HSE were strikingly unproductive. A closer look at the communication channels helps to understand what went wrong. As would be expected from a hazard-based model, HSE was more interested by the enforcement of the consultation distance than the merits of the risk assessments developed for the LPA by the developer's consultants. In addition, local planning practices are largely automated, which hinders any effective communication on benefits and risks. Since 2002 a computerised decision tool called 'Planning

Advice for Development near Hazardous Installations' (PADHI) has been used to support planning decisions. PADHI is a 4X4 matrix that leaves little room for risk/benefit decisions or direct communication between LPAs and HSE. In a nutshell a mix of rigidity and automaticity crippled the communication process. The structural lack of communication led to a deadlock. As a result, the Executive advised against the development, and finally invited the minister to call in. Interestingly, the HSE lost its case in 2010 despite the obviously risky nature of the project and the LPA was authorised to go ahead with the development.

In sum, regulators who wish to develop hazard-based regulation, for example to avoid lengthy risk analysis procedures and save time/money need to pay attention to the downsides of this approach. Hazard-based communication becomes particularly challenging for direct engagement with stakeholders and the wider public. It deprives decision-makers of essential tools for communication: the likelihood and probabilistic attributes of an event will help experts to focus on evidence. A discussion of benefits and risks will help the public to understand the rationale behind public choices. Without these concrete elements, regulators may well encounter increasing scepticism and distrust.

¹⁰ *Ibid.*